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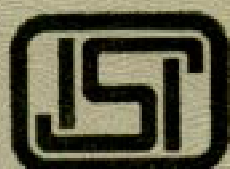
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*Indian Standard*  
CODE FOR DESIGNATION OF  
SEMICONDUCTOR DEVICES

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INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BHADUR SHAH ZAFAR MARG  
NEW DELHI 1

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# *Indian Standard*

## CODE FOR DESIGNATION OF SEMICONDUCTOR DEVICES

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INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 1

# *Indian Standard*

## CODE FOR DESIGNATION OF SEMICONDUCTOR DEVICES

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 12 December 1967, after the draft finalized by the Semiconductor Devices Sectional Committee had been approved by the Electrotechnical Division Council.

**0.2** The object of this standard is to provide a framework for a designation code for semiconductor devices which manufacturers of semiconductor devices may use for designating and numbering their devices and also for identifying the corresponding manufacturers' data sheet.

**0.3** The manufacture of semiconductor devices has been well established in this country and the number of manufacturing units and the variety of devices being put out by them have also increased. Simultaneously, the users of semiconductor devices have also multiplied at a fast rate thus calling for a wide range of properties of semiconductor devices to be covered. The need to designate the semiconductor devices and to encode each type number and its specification is also being increasingly felt.

**0.4** At present the various manufacturers are following a diversity of numbering systems. Also the users often rely upon the specifications and numbers originating in different countries. A variety of numbering systems is thus in current use and a series of cross references, equivalents, correlations, etc, have become necessary.

**0.5** Designation of devices developed within the country is also to be provided for. Device development has already begun at laboratory as well as at industry levels in the country and is likely to increase, as the semiconductor devices industry has been firmly implanted in the country. Hence the question of type numbers to be used on locally originated devices also requires solution.

**0.6** Each country has one accepted coding and designation system of semiconductor devices for use within the country. Considering the size, the magnitude and variety of potential market in India, unification and standardization of numbering system and adoption of a single code designation of semiconductor devices is clearly indicated.

**0.7** Adoption of any one of the systems existing abroad may not be the best solution because:

- a) Some of the systems are proprietary to a country or to a company;

- b) Devices originated in India would need designation and would need approach to the individual country whose system has been adopted for registration of each of these types; and
- c) In view of the variety of systems prevalent, choice of one of these systems has to be made.

**0.7.1** These considerations led the Committee responsible for the preparation of this standard to realize that proper solution would therefore be to evolve a system which could be used for devices made and used in India.

**0.8** It is also realized that for commercial purposes there might be need for the manufacturers to refer or use other known systems ( of Japan, Europe, USA, etc ) where considered expedient. It was also realized that in the meanwhile increased usage of the proposed common system should be established.

**0.9** The designation numbers derived from the code specified in this standard shall identify a specific semiconductor device and be displayed prominently on it. It shall also be included in the manufacturers' data sheet for that device and thus correlate the data sheet so numbered.

**0.9.1** Attempt has been made to embody in the first half of the coding system a general notation as to the nature and classification of the device. The second half of the coding system is a running number assigned serially in order of registration.

**0.10** For the purposes of allotment of code designation, the device manufacturers need only apply to a body designated for the purpose, together with the data giving the minimum essential ratings and characteristics of the device. This application will be received, codified and put on record by the body designated for this purpose.

**0.10.1** The ISI Directorate General which will be the appropriate body will work out the details of this procedure.

**0.10.2** It should, however, be emphasized that the procedure and the coding system are for the purpose of registration and record only and do not involve any implication of quality assurance. It is the responsibility of the user or the purchaser to ensure conformity of the device with the specified ratings and characteristics.

**0.11** This standard is one of a series of Indian Standards on semiconductor devices. A list of standards so far formulated in this series is given on P 6.

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## **1. SCOPE**

**1.1** This standard lays down the principles relating to the designation code for semiconductor devices.

## **2. TERMINOLOGY**

**2.0** For the purpose of this standard, the terms and definitions given in IS : 1885 ( Part VII )-1965\* shall apply.

## **3. DESIGNATION SYSTEM**

**3.1** The type number shall consist of a maximum of six symbols being combinations of digits and letters as detailed in **3.1.1** to **3.1.4**.

**3.1.1** The first symbol shall be a numeral indicating the general category of the device.

Thus:

- 1 will indicate diode
- 2 will indicate transistor
- 3 will indicate thyristor

**3.1.1.1** The basis adopted for this numbering is generally the number of leads emanating from the device less one, which is also generally equal to number of junctions in the device.

**3.1.1.2** The terms, diode, transistor, thyristor, etc, cover a variety of devices within themselves. For example, diode will include tunnel diode, rectifier diode, signal diode, variable capacitance diode, etc.

**3.1.2** The second symbol shall be a letter indicating the basic material from which the active portion of the device is made.

Thus:

- A will indicate Germanium
- B will indicate Silicon

**3.1.2.1** Further symbols for other materials will be formulated as and when necessary.

**3.1.2.2** From the user's point of view, the description of the basic material would be more important than details of construction. The description of the material would automatically indicate some limitation on the use of the device. For example, germanium could be used for temperatures up to 85°C while silicon could be used for temperatures up to 200°C. Whether the construction was alloy-junction or planar might not reveal much additional information. Hence description of material in the type designation is specified.

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\*Electrotechnical vocabulary: Part VII Semiconductor devices.



**3.1.3** The third symbol shall be a letter indicating the power-frequency limitation of the device according to a matrix given in Fig. 1.

Thus:

The letter *E* would indicate devices having a frequency limit lying between 3 and 30 Mc/s and a power dissipation lying between 1 and 10 Watts.

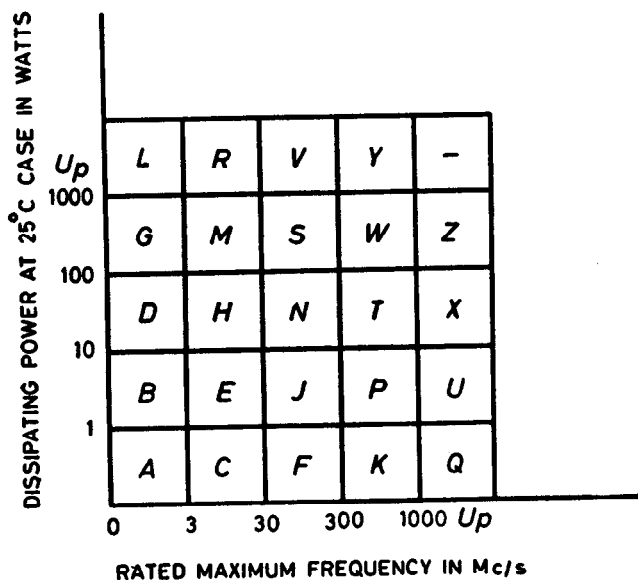


FIG. 1 POWER FREQUENCY MATRIX

**3.1.3.1** The frequency limit is defined as the limit specified for the major use of the device, that is, transition frequency for transistors, maximum rated frequency for rectifier diodes, etc.

**3.1.3.2** The method of construction of the matrix can be easily noted from the figure. The matrix squares are occupied by the alphabet in diagonal sequence.

**3.1.3.3** The levels include the upper limits specified and exclude the lower limits, that is, 0-1 power level includes 1 W also while 3 to 30 Mc/s will include 30 Mc/s but exclude 3 Mc/s.

**3.1.4** The three symbols specified in 3.1.1 to 3.1.3 above shall be followed by a numeral running from 100 to 999 allotted in sequence to each applicant for new device registration within the relevant category.

**3.2 Designation of Special Devices** — Devices having special effects and meant for specific use may be denoted by an added symbol at the end of the code specified in 3.1.

Thus for example:

<i>H</i>	for hall effect
<i>P</i>	for photo effect
<i>L</i>	for lasing
<i>T</i>	for tunnel effect
<i>Z</i>	for zener

#### 4. TYPICAL EXAMPLES

**4.1** Typical examples describing the designation specified in this standard are given below:

- a) 1 *AK* 134 : A germanium diode in the power level of 0 to 1 W and frequency level of 300 to 1 000 Mc/s having a serial number 134.
- b) 2 *BE* 372 : A silicon transistor in the power level of 1 to 10 W and frequency level of 3 to 30 Mc/s having a serial number 372.
- c) 3 *BD* 473 : A silicon thyristor in the power level of 10 to 100 W and frequency level of 0 to 3 Mc/s having a serial number 473.

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